

SPECIAL HANDLING

NRO review(s) completed.

12 June 1962

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MEMORANDUM TO:

[Redacted]

Cor-1685
COPY 1 OF 1

SUBJECT : Review of ITEK Management Relating to Project 9040

1. Our recent visit to your company was most agreeable and constructive to us in giving a much clearer understanding of the way in which your government projects are being accomplished. A review of our notes has caused several suggestions to occur to us, which we are passing on for what you feel they are worth.

2. We were especially pleased with the very clear statements from management of the determination to produce results in Project 9040 and with the expression of full support from the Board of Directors. These assurances left no doubt in our minds of your intentions, so that any comments which follow should be construed only as presenting our impression of the ease or difficulty which may attend their fulfillment.

3. Our comments are as follows:

A. It was noted that a very direct line of command runs the route: [Redacted] with the principal interest of the first three named being confined to only two projects. This situation is conducive to project engineering at all levels and, we feel, should be watched from the standpoint of unclear designation of authority and the Project Manager having too many bosses. It is to be noted that within ITEK there has been difficulty in the past from a confusion of individual responsibilities.

B. A related condition exists within Project 9040. The heart of the project resides under the "Operations" block, while the Project Manager directs in addition only support functions. Here again, unless there is a very clear understanding of the division of authority, there is a possibility of confusion and dissatisfaction.

C. We were in favor of the "task force" method of project manning based upon "home rooms". It was observed, however, that there were several exceptions being made to this principle, and we recommend that it be followed as completely as practicable.

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to Project 9040

D. The team noted, however, a potential program cost control deficiency inherent in the Task Force - Home-Room Organization. We are concerned over the Project Manager's ability to resist unnecessary assignment of personnel to his project during periods of reduced overall division project activity or at any time the basic pool loading is considered high. The adoption of a procedure to bolster the Project Manager's control over such situations is suggested.

E. It was stated that 9040 responsibilities have been assigned to the Palo Alto office. It has been our observation that in the past these services may not have been employed as fully as would be desirable. Our suggestion is that this office play an active part in 9040 West Coast operations, especially in your relations with System Engineering.

F. It was observed that specific statements of the officially approved functions of each organizational segment were provided by updating a generalized Policy and Procedure Bulletin dated May 8, 1961. The implication is that this subject may require some further study, again in relation to avoiding fuzzy understanding of responsibility.

4. We have appreciated your cooperation in aiding us to make this informal survey. We are most hopeful that with the continued vigorous application of intelligence and industry on the part of all concerned this important project will be successful.

C. L. BATTLE
Colonel, USAF
Director, 622A Program

SPECIAL HANDLING

Itek Corporation
Lexington, Massachusetts

June 6, 1962

AGENDA

MANAGEMENT PRESENTATION

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Corporate Management	30 min.
Optical Systems Division Management	30 min.
Management Review	15 min.
Budgeting, Accounting, and Cost Estimating Procedures	30 min.
Internal Audit Program	15 min.
Facilities	10 min.
Luncheon	

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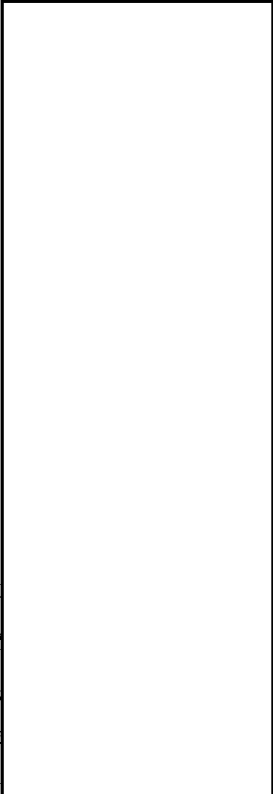
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June 6, 1962

AGENDA

PROJECT PRESENTATION

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Organization		15 min.
Financial Plan - Project		30 min.
Schedule & Milestones		30 min.
Coffee		15 min.
Project Review		30 min.
Test Program, Reliability, Change Control, Q. A., In- tegration, Specifications		30 min.
Discussion		

OPTICAL SYSTEMS DIVISION

ITEK CORPORATION

June 4, 1962

DOCTRINE FOR PROJECT ORGANIZATION

In order that a common view of Division policy for project organization can be had within this Division, this paper is made available. It does not purport to describe the procedures within functional segments, but rather how these segments should come together in the pursuit of projects.

The Optical Systems Division has been established to handle project activity. To do this, it has been equipped and fashioned internally to deal with a specific grouping of project characteristics (to be described below).

Since real life rarely evolves as clearly as the plan, differences and local adjustment must be expected. But this, in any case, sets forth my policy.

I. Basic Organization Tenets

Our organizational scheme has flowed from certain convictions that can be identified and aired. These are:

- A. Organization should be fashioned around the character of the task at hand.
- B. Healthy incentive and healthy sense of participation are mutually supporting.
- C. Knowledge necessary to the wise use of authority is diffuse.

The first of these is almost a platitude, but most of us have seen and suffered examples of its neglect. Today's task struggling within last year's format is the way it often happens and results in such things as the doing of development in an environment of production line work. The corollary of this is: organizational arrangement will be changing along with real trends in task character. Generally, organization cannot be fashioned around tomorrow's task if its character has essential differences from today's. Although it is possible, and sometimes desirable, to build growth potential into an organizational scheme; this is to be avoided if there is any encumbering of the task at hand.

The second conviction, having to do with incentive and sense of participation, is peculiarly important where the work to be done is either creative in nature or involves extremes of performance in the resulting

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item that are dependent on several overlapping disciplines and technology that has not been reduced to routine. A group of experts working closely together toward a single achievement can in such cases always outperform the same experts centralized to their separate disciplines or functions. When the end result of the project is understood and shared by all participants, collaboration without conflict or lost-motion is optimized.

The problem of bringing the essential facts to bear on the decision making processes (to which the third tenet above addresses itself) is often best handled by moving the decision making point downward to the level where these facts are best understood. There are certainly many rules and procedures which must be imposed from the top but these must be husbanded and held to a minimum so that they do not lose effect by dilution. As organizations grow larger, one of the major causes of inefficiency is the blind application by managers of too many procedures to too many situations without allowing for the local exercise of judgement. Good discipline in the following of rules is essential to any organization and it cannot be encouraged if intelligent people continually find themselves carrying out procedures which they see as not in the best interest of the company or the program. Our procedures and revisions must keep pace with the needs of our organization and its tasks.

II. Pertinent Characteristics of the Task at Hand

The projects in house together with the projects being proposed in the Optical Systems Division have certain features which establish their essential character and can be enumerated:

- A. Typical programs in the OSD are presently characterized as for Government customers. This connotes a set of rigid specifications and formal procedures that influence strongly the method of handling.
- B. The programs all call for extreme performance in the resulting item, always well beyond what has been achieved before, and often representing a complete breakthrough technologically.
- C. The schedule pace is always extremely tight.
- D. The dollar budgets have the tightness that goes with competitive bidding and vigorous negotiations.
- E. Typical projects have a term of twelve to twenty-two months with a mean of around eighteen.
- F. The programs are normally for small numbers of end items: one or two being not uncommon and more than twelve quite rare. Major changes and improvements within a run are almost inevitable.

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- G. The hardware resulting from a program generally goes straight into operational use. Because there are no service test items or opportunities, there is a finality about the engineering needed. Playing for keeps from the beginning calls for attention to reliability, use environment, interface with collaborating systems and field engineering that is intense and allows for no later chances to creep up on the performance required.

III. Special Needs that Flow from These Characteristics

A. Convergence

Creative engineering can be achieved only if the attention and dedication of the contributors is focussed on the task with unity of purpose and without distraction or dilution.

B. Science

As we are committed to accomplishing extreme performance objectives, the frontiers of knowledge in our field must be explored and made familiar. Fundamental work in Optics, Photogrammetry, Photochemistry, Materials, Electronics, and Data Management as found in our Research Division loom mandatory as an inherent part of our capability.

C. Technology

Technical resources must provide advanced engineering in all disciplines (Optics, Mechanical, Electrical, Test, and Systems). In addition, Design, Drafting, and Checking services together with special Model Shop fabrication and assembly efforts must be specialized to precision optical systems. Prime capability in Quality Assurance and Reliability must be built in, as well as the Environmental and Test facilities and know-how.

D. Vision

Because we serve a rapidly advancing market and because it responds best to a creative stimulus from us, Systems Planning must provide the vision of advanced programs which will cope with the future requirements of government users.

E. Creative Opportunity

In addition to the scientific and technical resources, there must be room for spontaneous innovation internal to Optical Systems Division. Monies and man hours to try and to demonstrate technical advances must be budgeted.

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F. Flexibility

A project is not a career; and rearrangement of people, toward the close of a project, into new groupings must be anticipated and easy. With each program, we face a different task under different conditions often displaying little continuity with the previous program.

G. Continuity

The net capability in the various disciplines must continue to grow in size and scope. Further, the career development of individuals needs guidance in the long term that cannot be provided by project management.

H. Planning and Control

Achievement of project commitments requires effective management decision-making in the dimensions of schedule, cost, and performance. The characteristics of the tasks place a premium on our ability to manage in these dimensions. Continuing development and improvement of an integrated system for planning and controlling projects is fundamental to our success in project management.

IV. Organizational Doctrine

These ingredients can come together properly only when allowed to by the organizational structure. Further, the structure must both provide for the short term (projects in hand) and allow for the long term interests of the Division.

Since the present work of this Division involves feats of engineering, against tight budgets of time and money, the present organizational concept is oriented around the project. The basic method is to charge the Project Manager with successful completion of the project and to provide him with the resources he needs. As many as possible of these should be assigned organically, the balance should be built in as closely as feasible. (Successful completion of a project extends in scope through delivery of tested equipment and often through field service. It is measured in the dimensions of schedule, cost and performance.)

A special adaptation of the self-sufficiency theme is the provision of optical components. Optics is so important and so precious to the Optical Systems Division as to justify special arrangement.

In the typical program, optics will represent an innovation, tailored to the project and of extreme performance. Here, Applied Optics will operate essentially as an associate contractor. The project manager will perform in a "Systems Management" capacity, first by obtaining a sound and complete set of performance criteria for the task, and second by insuring that results conform to the approved plan.

In the case of the major project, the self-sufficiency of the collected resources operating as a team will be fairly complete. Smaller projects may be grouped to share a portion of the resources. But even here, Engineering, Administration, Design, Assembly, and Test will normally be organic to each project.

A large project is not immune to the dangers of functional grouping internally, particularly one in which there are many short duration tasks within the same discipline. However, experience with project team grouping on the smaller programs recommends it for major segments of large projects.

V. The Interwoven Concept: Discipline Sponsorship

Inherent in the project concept are two interlocking considerations which provide strength to the present and future success of project management. The first is vertical and is made up of the task responsibility described above. The second is horizontal and is known as the "home room" or discipline sponsorship method.

Because projects have a typical life of 18 months, provision must be made for continuity in the assignment of people. Even if the ethical considerations could be set aside, a policy of hiring engineering and technical personnel only for the term of the project could never succeed. The quality and team proficiency needed is a perishable and will keep only where an environment of tenure and good faith is offered by management.

Accordingly, all project members have a sponsor (within their respective disciplines) located outside the project, and to whom they can look for long-term stewardship of their future assignments and career development. This relationship is portrayed in Fig. 1.

As much as possible, project team members are assigned to the project organically while their need there lasts. The engineering team, for instance, are assigned, as are designers and draftsmen, schedulers, administrators, model control, and coordinator personnel. But for each group there is a discipline sponsor who was involved in their original assignment to the project, the propriety of their current employment, and who will be involved with their relocation when their contribution to the project is completed.

Other team members (e.g., Purchasing, Quality Assurance, Contract Administration) are attached to the project but remain assigned to their parent unit for procedural control. By co-location and exclusive participation as an intimate member of the team, a singleness-of-purpose and direct knowledge of project needs is achieved. The spectre of conflicting interest between incentive for the project and loyalty to the parent group will arise only where shallow minds or mis-matched personalities occur among the participants or their sponsors. Mandatory procedural regulations for the protection of overall company and customer interests will be well understood and respected by all hands.

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In dealing with the broad spectrum of engineering personnel, we have developed a strong team of sponsors in the fields of Mechanical Engineering, Optical Engineering, Electrical Engineering and Systems Engineering, representing the highest level of competence in their respective disciplines. This team, with others as necessary, take part in the program review. (System Design and Review.) At predetermined points in a program a review is held where the concepts and progress are reviewed. Through this medium we are assured of the cross fertilization of ideas through advances in other programs or research and the possible application to the task at hand. Continued use of this technique provides communication to all levels of technical personnel of the latest advances and assures continued excellence of our products.

The Project Manager should be unencumbered as much as possible with administrative and personnel responsibilities which do not contribute to the successful completion of his project. Discipline sponsors must assume such burdens in relation to the project membership. This will include: finding and assigning acceptable people, providing for their continued training, assuring their adherence to procedural standards, their upgrading, their career planning and arranging their next assignment. The Project Manager and his key Project Engineers will, however, assess the work of project members. This performance evaluation will have bearing on upgrading, future assignments, and career development. Normally (and not improperly) the good Project Manager will want to concern himself with several of these functions, but nothing should fall apart if he does not.

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PROJECT ORGANIZATION

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